

Listing of Claims

1 – 20 (canceled)

21. (previously presented) A turbo engine, comprising:

a plurality of rotor blades made of an electrically conducting material having an electrically insulating surface and arranged on a rotor shaft that is rotatably mounted in a housing and electrically connected to a reference potential or a plurality of fixed guide vanes made of an electrically conducting material having an electrically insulating surface with the electrically conducting material of the guide vanes electrically connected to the reference potential;

a measuring element operating in a kilohertz frequency range for measuring an electric or magnetic field strength set up by a charge distribution on the electrically insulating surface of the rotor blades or guide vanes and for generating a signal indicative of the electric or magnetic field strength, wherein the strength of the electric or magnetic field is indicative of a level of wear or a defect that can arise in the electrically insulating surface;

wherein the measuring element is arranged near a radially disposed row of the rotor blades or near a radially disposed row of the guide vanes, and further wherein the frequency range is based on a rotational speed of the turbo engine and the number of rotor blades per row or the number of guide vanes per row; and

a monitoring unit for determining when the signal deviates from a threshold being defined responsive to at least one of a load condition of the turbo engine and a location of the rotor blades or the guide vanes relative to an outlet of the turbo engine.

22. (previously presented) The turbo engine as claimed in claim 21, wherein at least one measuring element is arranged on the rotor shaft in the region of the guide vanes.

23. (previously presented) The turbo engine as claimed in claim 22, wherein at least one measuring element is arranged in the region of the rotor blades and at least one measuring element is provided for measuring an electric or magnetic field strength set up by the first charge distribution on the surface of the rotor blades.

24. (previously presented) The turbo engine as claimed in claim 23, wherein at least one measuring element is formed by a coaxial antenna.

25. (previously presented) The turbo engine as claimed in claim 23, wherein at least one measuring element is connected to a measuring unit.

26. (cancelled)

27. (previously presented) The turbo engine as claimed in claim 25, wherein the measuring unit has a communication link to a control center.

28. (previously presented) The turbo engine as claimed in claim 21, wherein the monitoring unit comprises a signaling or an alarm device.

29. (previously presented) The turbo engine as claimed claim 21, wherein the turbo engine is shut down by the monitoring unit.

30. (previously presented) The turbo engine as claimed in claim 23, wherein the electrically insulating surface is formed by a coating.

31. (previously presented) The turbo engine as claimed in claim 23, wherein the turbo engine is a gas turbine.

32. (previously presented) A method for determining damage to an electrically insulating surface of a turbine component, comprising:

providing a plurality of turbine blades or vanes made of an electrically conducting material and arranged within a turbo engine;

creating an electric or magnetic field strength by a charge distribution on the electrically insulating surface of the turbine blade or vane;

measuring the electric or magnetic field strength by a measuring element operating in a kilohertz frequency range, wherein the strength of the electric or magnetic field is indicative of a level of wear or a defect that can arise in the electrically insulating surface;

positioning the measuring element near a radially disposed row of the rotor blades or near a radially disposed row of the guide vanes, and wherein the frequency range is based on a rotational speed of the turbo engine and the number of rotor blades per row or the number of guide vanes per row;

defining a threshold responsive to at least one of a load condition of the turbo engine and a location of the rotor blades or the guide vanes relative to an outlet of the turbo engine; and

determining when the electric or magnetic field strength deviates from the threshold.

33. (previously presented) The method as claimed in claim 32, wherein the measuring element is arranged on a rotor shaft in the region of the vanes.

34. (previously presented) The method as claimed in claim 32, wherein the deviation is transmitted to a control center.

35. (previously presented) The method as claimed in claim 32, wherein an alarm is output when the threshold is exceeded.

36. (previously presented) The method as claimed in claim 32, wherein the turbo engine is shut down when the threshold is exceeded.

37. (previously presented) The method as claimed in claim 32, wherein a measurement signal supplied by the at least one measuring element is transformed by a Fourier transformation, by a measuring unit.

38. (previously presented) The method as claimed in claim 37, wherein a FFT transformation unit is used.

39. (previously presented) The method as claimed in claim 38, wherein a result of the transformation is displayed or signaled.

40. (previously presented) The method as claimed in claim 39, wherein the result of the transformation is compared with the threshold.

41. (previously presented) A turbo engine, comprising:
a plurality of rotor blades made of an electrically conducting material having an electrically insulating surface and arranged on a rotor shaft that is rotatably mounted in a housing and electrically connected to a reference potential or a plurality of fixed guide vanes made of an electrically conducting material having an electrically insulating surface with the electrically conducting material of the guide vanes electrically connected to the reference potential;
a measuring element operating in a kilohertz frequency range for measuring an electric or magnetic field strength set up by a charge distribution on the electrically insulating surface of the rotor blades or guide vanes and for generating a signal indicative of the electric or magnetic field strength, wherein the strength of the electric or magnetic field is indicative of a level of wear or a defect that can arise in the electrically insulating surface;
wherein the measuring element is arranged near a radially disposed row of the rotor blades or near a radially disposed row of the guide vanes, and wherein the frequency range is based on a rotational speed of the turbo engine and the number of rotor blades per row or the number of guide vanes per row; and
a monitoring unit for determining when the signal deviates from a threshold being defined responsive to a load condition of the turbo engine.